

In re Patent Application of:

FARRIES

Serial No. 09/886,998

Filed: 06/25/2001

REMARKS

Claims 1-17 are pending in this application.

Claims 1-12 and 15-17 are rejected under 35 U.S.C. 103(a) as being unpatentable over Ooi, et al. (US Patent 6,118,564) in view of Lin et al. (US Patent 6,782,203).

Claims 13-14 are rejected under 35 U.S.C. 103(a) as being unpatentable over Ooi, et al. (US Patent 6,118,564) in view of Lin et al. (US Patent 6,782,203) and in further view of Pan et al. (US Patent 5,652,814).

Claims 1, 13 and 15 have been amended.

Introduction

An object of instant invention is to provide a low loss, low error rate, high bit-rate demultiplexer capable of demultiplexing optical signals, particularly in the presence of overlap of adjacent wavelength channels.

In a wavelength division multiplex (WDM) optical communication system, a problem of optical crosstalk between adjacent channels can arise where the optical bandwidth of such channels widens as the transmission rate is increased while the spacing between channels is fixed, for instance according to the ITU frequency grid.

To practically solve the problem underlying the demultiplexing of closely placed wavelength channels in WDM systems, optical filters of high figure-of-merit and separating qualities are required. For a system of many channels this increases the

In re Patent Application of:

FARRIES

Serial No. 09/886,998

Filed: 06/25/2001

cost, vulnerability to drift and can reduce reliability of transmission.

A further limitation of optical filters is that the achievable figure-of-merit tends to decrease as the width of the filter pass band is increased. Thus it is advantageous to reduce the optical signal bandwidth before performing the final filtering of a channel. This final filtering is often referred to as post-filtering.

With this invention, only a small number of high quality filters are required at the input of the demultiplexer where the WDM optical traffic is split into several groups of closely spaced optical channels. Optical time domain demultiplex is then used to reduce the bandwidth of each channel while maintaining the incipient channel spacing. Finally, to separate or demultiplex these narrowed bandwidth signals, optical filters of lower figure-of-merit can be applied with no penalty.

This use of OPTICAL TIME DOMAIN DEMULTIPLEX for reduction of channel bandwidth is novel, in particular when applied in three stages: optical wavelength domain demultiplex + optical time domain demultiplex + optical wavelength domain demultiplex. Known prior art systems consist of only the optical wavelength domain demultiplex + optical time domain demultiplex stages or optical wavelength domain demultiplex + electronic time domain demultiplex stages.

Argument A

The Examiner states in the communication dated 12th October

In re Patent Application of:

FARRIES

Serial No. 09/886,998

Filed: 06/25/2001

"1. Applicant's arguments with respect to claims 1-17 have been considered, Examiner does not agree with the applicant's arguments."

Further, it is stated that:

"About argument A, in the system of Ooi et al. modified by Lin et al., Lin et al. teach that a multi-wavelength signal is demultiplexed into single wavelength channels using wavelength demultiplexing apparatus 350, 351, ..., of Lin et al. before being sent to time demultiplexing apparatus 30-1, 30-2, ..., of Ooi et al., for example, see $\lambda_1, \lambda_2, \dots, \lambda_n, \dots$, by DEMUX #1, #2, ..., in Fig.7. Therefore, the clock recovery and identification functions would work properly."

With reference to amended Claim 1 of instant application, an apparatus for optical time division demultiplex of a signal stream containing multiple wavelengths is claimed,

"wherein at least one of the demultiplexed wavelength bands has more than one wavelength channel for carrying data information;"

but not single wavelength channels, as referred to by the examiner with regard to Lin et al. in the above excerpt. This is a fundamental difference. As was argued in Argument A of the previous action, Ooi et al. teach a system whose identification circuit, also known as identification element, cannot function as described if more than one wavelength is input to it. This argument is elaborated below with additional

In re Patent Application of:

FARRIES

Serial No. 09/886,998

Filed: 06/25/2001

examples. It should be noted that in amending claim 1, in this response, the applicant has taken care to ensure that no new matter has been added and that separated channel bands be defined in such a manner as to more clearly distinguish them from Ooi's single wavelength channel which enters each optical switch of his demultiplex apparatus. The applicant has defined the plurality of channels as "bands having a wavelength separation therebetween larger broader than the predetermined channel spacing and, wherein at least one of the demultiplexed wavelength bands stream has more than one wavelength channel for carrying data information" (claim 1(a)).

On the question of clock recovery, the applicant agrees with the examiner that it can be made to work properly for a signal containing multiple wavelengths both in the instant invention as well as in the system Ooi et al. describe. However a properly recovered clock signal does not provide sufficient means for enabling the identification circuit to separate signals on different wavelengths. Thus Ooi et al. describe a system which is not capable of performing a key function disclosed in instant application. Neither do they advance a motivation or suggest a means for performing such signal separation based on wavelength after the time division demultiplex.

In summary, the ability to process multiple wavelengths **after** the optical time domain demultiplex is claimed in the independent claims 1, 13 and 15 of instant application, but is neither taught nor suggested by Ooi et al.

In re Patent Application of:

FARRIES

Serial No. 09/886,998

Filed: 06/25/2001

Claim 1

The office action states that the instant application should be obvious by the combination of the wavelength division demultiplex according to *Lin et al.* (US Patent No: 6,728,203) with the time division demultiplex according to *Ooi et al.* (US Patent No: 6,118,564).

Ooi et al. focus on solving the problems associated with locking a clock signal to optically time division multiplexed signals by presenting suitable dithering techniques. Some of their embodiments include a second wavelength division demultiplex in front of the optical time domain demultiplex.

In contrast, instant application improves optical system cost and performance by disclosing a three-step demultiplex technique in which preliminary wavelength division, time division and final wavelength division demultiplexing is applied in sequence. The invention addresses problems associated with overlap of broadband channels in the wavelength domain by using time division demultiplex to reduce channel bandwidth thereby permitting optical wavelength post-filtering to be applied with low signal strength loss using low cost optical filters.

Ooi et al., on the other hand, do not mention bandwidth of the signal channels, nor give this important aspect any consideration. However, reduction of signal bandwidth is one of the objects of instant invention.

It is stated in the office action

In re Patent Application of:

FARRIES

Serial No. 09/886,998

Filed: 06/25/2001

"Regarding claim 1, Ooi et al, an optical demultiplexer for demultiplexing an optical signal having a plurality of channels at a predetermined channel spacing comprising: (b) time domain demultiplexing means (For example, 107A, 30-1, Fig.7) for receiving one of the plurality of wavelength streams and for dividing the one of the plurality of wavelength streams (One of multi-wavelength signal is input at 107A, Fig.7) into a plurality of time domain demultiplexed wavelength streams (Col.25, lines 31-35);"

The applicant has difficulty understanding this paragraph, as it appears to be incomplete, however further arguments are based on the best interpretation.

The reference within Ooi et al., Col.25, lines 31-35, referred to by the examiner reads:

"The clock signal generation element 21 of each of the optical demultiplexers 30-i generates a desired clock signal for optical time division multiplexing processing from the optical time division multiplex signal as a received light signal."

Within this quotation, no reference appears to be made to the mentioned "plurality of wavelength streams", "predetermined channel spacing", nor any indication that the output of demultiplexer 30-1, Fig.7, shown in the figure as going to the identification element, may contain a plurality of wavelength streams.

In re Patent Application of:

FARRIES

Serial No. 09/886,998

Filed: 06/25/2001

In fact, Ooi et al. explicitly state at several points in their specification that all wavelength division demultiplex is performed **prior** to time division multiplex being carried out, for instance in col. 16, lines 3-5:

"The first optical splitting element 11 described above may be constructed so as to wavelength demultiplex a wavelength multiplexed component of the received signal light."

The same idea is restated in col. 42, lines 18-25:

"The optical time division demultiplexing apparatus 80 according to the eighth embodiment is different from the optical time division demultiplexing apparatus of the embodiments described above in that, if an inputted optical time division multiplex signal is a wavelength multiplexed signal, then it wavelength demultiplexes the inputted optical time division multiplex signal first and then performs time division demultiplexing processing."

Most importantly, careful reading of the text and figures of Ooi et al. reveals that nowhere does he teach or suggest that following the optical time demultiplex process, signal channels are demultiplexed on the basis of wavelength. In fact, what is taught is that signal channels are demultiplexed exclusively on the basis of time slots, as illustrated, for instance, in figures 27 and 28 or figures 30 and 31 and described in related text.

It is important to recognise that if the signals output from the optical switches (e.g. '22 in Figs. 4 and 7) were to

In re Patent Application of:

FARRIES

Serial No. 09/886,998

Filed: 06/25/2001

contain more than one wavelength channel, they would cause a departure from the two-level digital signals that Ooi et al teach throughout their patent.

Perhaps this can be best illustrated graphically, as in Fig. 1, where Ooi's Fig. 7 is depicted as annotated by the applicant. Assume for example a time- and wavelength-division multiplexed signal containing λ_i , λ_j , λ_k , is input into the light demultiplexing and branching element 107A, which divides it into two wavelength streams with λ_i and λ_j going to optical demultiplexer 30-1 in the upper branch and λ_k going to 30-2 in the lower branch.

The signal portion bearing the two channels on wavelengths λ_i and λ_j , time-division demultiplexed by optical switch 22, exits optical demultiplexer 30-1 within the same time slot and enters the identification element that follows. There is no mechanism described or implied, nor a motivation suggested by Ooi et al. for distinguishing λ_i and λ_j at the output of demultiplexer 30-1.

On the other hand, the signal portion containing only a single channel carried on wavelength λ_k exits optical demultiplexer 30-2 within another separate time slot and enters the identification element that follows, where it can be uniquely identified and received. The applicant respectfully submits that this is the way Ooi et al. intended their invention to function.

In contrast, the instant application defines (for instance in claim 1(c)) a means for demultiplexing the signal channels

In re Patent Application of:
FARRIES
 Serial No. 09/886,998
 Filed: 06/25/2001

carried on wavelengths λ_i , λ_j with an additional wavelength division demultiplex or wavelength filter.

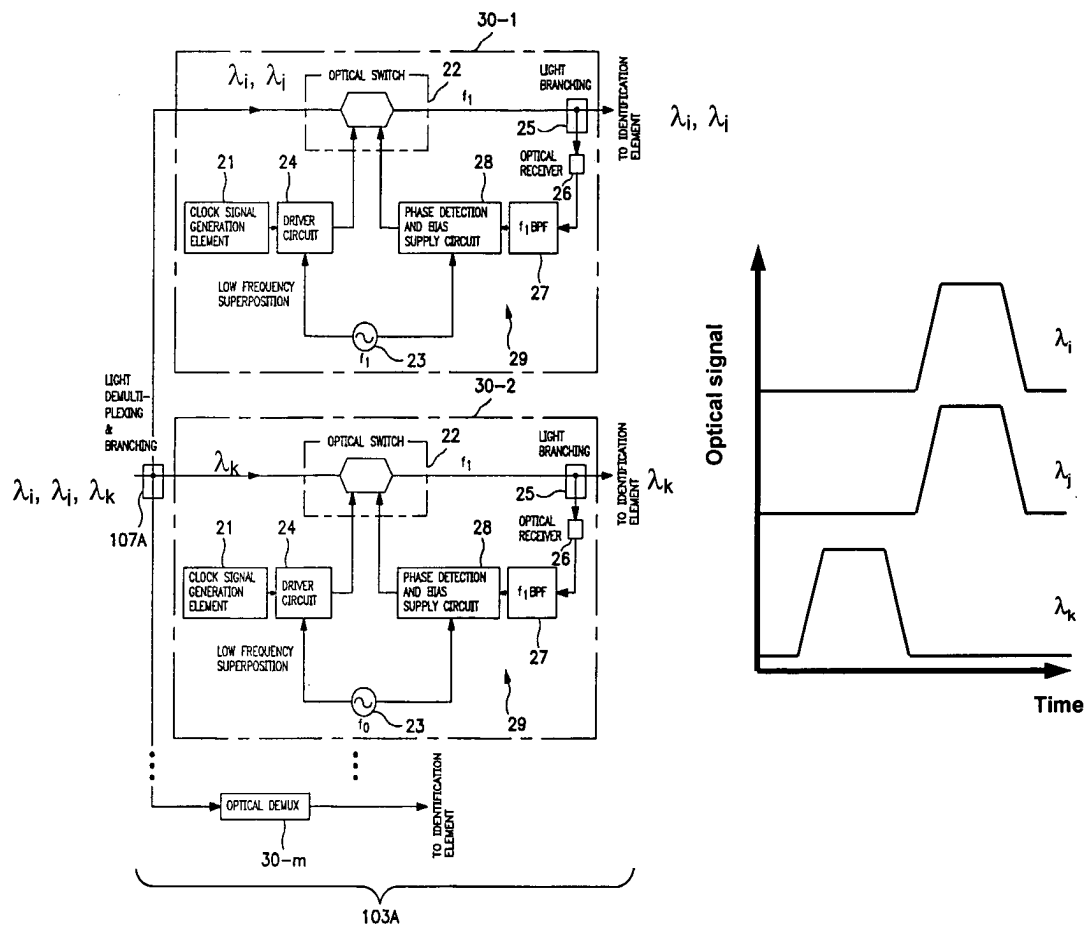


FIG. 7

Figure 1 showing Ooi's annotated Fig. 7

From this example it should be clear, that Ooi's system would be incapable of demultiplexing two high-speed optical signals

sharing the same time-domain slot but carried on two different wavelengths.

The reason is that the two signals would add arithmetically by simple summation of their respective photocurrents in the photodetector of the corresponding identification element to produce a tri-level digital electrical signal. This tri-level signal would assume a zero level when both signals are zero, a unit level when one of the signals is in "high" state, and a level two units in magnitude when both signals are in the "high" state. Thus, upon sampling the electrical signal at the time instant set by the identification clock (f in Fig. 27, for instance), a tri-level signal would be output from which the two original signals would not be distinguishable.

Another example illustrates the wavelength division function Ooi et al. intended in another embodiment. Figure 2 shows theri Fig. 17 with the expected waveforms added by the applicant as deduced from their specification.

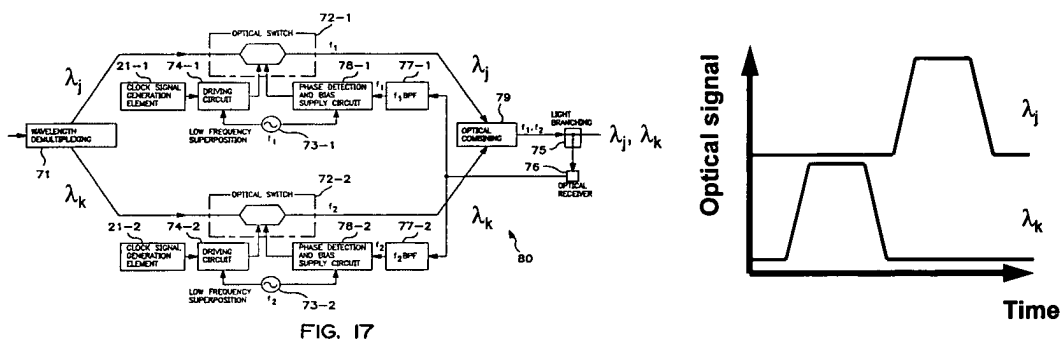


Figure 2 showing Ooi's annotated Fig. 17

When two channels carried by wavelengths λ_i , λ_j enter wavelength demultiplexing 71 they are split into two separate paths, each time division demultiplexed by their respective optical switches 72-1 and 72-2, recombined at the optical recombining 79 and exit the light branching 75. Now each (wavelength) channel occupies its own time slot, as illustrated by the waveforms on the right in Fig. 2, so that the subsequent identification element (not shown) can distinguish them as determined by the clock signal timing.

As a further example, the fifth embodiment shown in Fig. 12 may lead one to speculate that the output signals c , f , j from optical switches 42-1, 42-2, 42-3 respectively could in fact be used for further optical wavelength demultiplexing. However, the description (Col. 32 line 65 to col. 33 line 6) teaches:

"Also the optical time division demultiplexing apparatus 40 shown in FIG. 12 can be applied, similarly to the optical time division demultiplexing apparatus of the embodiments described above, to an optical receiver which performs optical time division demultiplexing for an optical time division multiplex signal from the optical transmitter 102 of such an optical time division multiplex transmission system as described hereinabove with reference to FIG. 32."

In other words, the output signals mentioned above are intended for an optical receiver. This in turn implies the termination of the optical stream into a photodetector and consequent conversion into an electrical signal. In contrast,

claim 1(c) of instant application defines the further step of demultiplexing based on wavelength division.

So, it must be concluded that Ooi et al. actually teach away from further demultiplexing subsequent to the optical time domain demultiplexing. This is also clearly stated in col. 23, lines 60-63:

"It is to be noted that a branched light signal outputted from the optical switch 22 to the identification element 110 or the identification element identification element [sic] 111 via the light branching element 25 is identified as a demultiplexed signal."

(Presumably the numerals 110, 111 refer to Fig. 32, the only figure where the identification elements are so designated, while the other numerals refer to Fig. 4 but not Fig. 6 as stated in col. 22 line 57, based on the description). In all relevant figures (Figs. 10, 26, 29, 32 and 36), the identification element is shown at the end of the signal processing chain, thus precluding any further optical processing, including time or wavelength division multiplex.

In conclusion, Ooi et al. do not teach the processing of more than one wavelength within the optical switches and subsequently identification units of their optical time domain demultiplex system. We have shown above that their optical time domain demultiplex system is not practical in cases where the input optical signal applied to the time domain multiplexer switches contains a plurality of wavelength channels. Further, Ooi et al. do not teach or suggest

additional demultiplex of the signal subsequent to the optical time domain demultiplex they describe.

Therefore, claim 1 of instant application cannot be regarded as an obvious derivation of *Ooi et al.* since their disclosure teaches away from at least two essential elements disclosed in instant application: the concurrent time division multiplex of a plurality of wavelength bands (claim 1(b)) and a subsequent optical filtering means for their wavelength demultiplexing (claim 1(c)).

It is further said in the Office Action that

"it would have been obvious to a person having ordinary skill in the art at the time of the invention to incorporate a demultiplexer apparatus, such as the one of *Lin et al.*, to replace the LIGHT DEMULTIPLEXING & BRANCHING in the system of *Ooi et al.* in order to obtain output signal with larger frequency spacing than that of input signals."

Lin et al. (assuming US Patent 6,782,203 is intended, not 6,728,203) teach a scalable optical demultiplexing apparatus with the wavelength spacing larger than the predetermined channel spacing plus post filters (Fig.7).

Instant application addresses problems arising within high-capacity optical systems, where the overlap between neighboring optically wavelength division multiplexed channels can be appreciable. Under these circumstances, the post filters 320, 321, etc. in Fig. 7 of *Lin et al.* would not be capable of resolving the separate channels without incurring substantial signal loss. Taking λ_2 in Fig. 7 as an example, due

FARRIES

Serial No. 09/886,998

Filed: 06/25/2001

to the wide bandwidth and close spacing of the optical channels, one output from DEMUX 310 would predominantly contain λ_2 , but with relatively strong components of neighboring channels λ_1 and λ_3 superimposed. While the post filter 320 would be very effective in removing the wavelength components $\lambda_2 \pm \text{FSR}$, $\lambda_2 \pm 2 \text{ FSR}$, etc. it would not be as effective in removing the neighboring channels λ_1 and λ_3 .

Claim 1(b) of instant application defines the use of optical time domain demultiplexing as a means to reduce the optical bandwidth of the channels. As an example, a 40 Gb/s optical signal stream can be demultiplexed by time domain techniques to 4 streams of 10Gb/s each, with attendant reduction in optical bandwidth. Thus, a narrower pass-band post filter can be used to separate the λ_2 channel from its neighboring channels λ_1 and λ_3 . If one were to compare instant application with the apparatus disclosed by Lin et al., the time domain demultiplexing would be interposed between demux 310 and post-filter 320 in Fig. 7 of Lin et al.

Such optical bandwidth reduction comprises one of the objects of instant disclosure (for instance, claim 1(b)), for which Lin's patent has no corresponding counterpart. Clearly the bandwidth and cross-talk problems have not been recognized by Lin et al., nor have they suggested, explicitly or implicitly, a remedy therefor. Thus it is not at all obvious how instant disclosure can be derived from the teachings of Lin et al. It is therefore respectfully submitted that in the absence of a motive or an appropriate example from the patent of Lin et al., it would not have been obvious to a person having ordinary skill in the art at the time of the invention to

In re Patent Application of:

FARRIES

Serial No. 09/886,998

Filed: 06/25/2001

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incorporate an optical time division demultiplexer apparatus as claimed in instant application.

In response to the examiner's concerns, the wording of claim 1 has been reworked without altering the content so that it may be more clearly distinguished from prior art.

Claims 2-12

These claims are dependent on claim 1. While taken separately they may have some commonality with of the embodiments disclosed by Lin et al. and Ooi et al., they cannot perform the overall functions according to instant disclosure in isolation.

Claim 15

The examiner states that

"Ooi et al. teach a method for demultiplexing a high bit-rate signal on a dense optical grid comprising:
performing an optical time domain demultiplexing for dividing at least one of the wavelength streams into a plurality of time demultiplexed streams (Col.25, lines 31-35, for example, one of multi-wavelength signal is input at 107A, and time-demultiplexed by 30-1, 30-2, ..., Fig.7)"

"Ooi et al. differ from the claimed invention in that Ooi et al. do not teach the steps (a) providing the high bit-rate signal including a plurality of wavelength channels at a predetermined channel spacing to a coarse wavelength demultiplexer (Lin et al. teach using input multi-wavelength signals into DEMUX #1, #2, ..., with

predetermined spaces between $\lambda_1, \lambda_2, \dots, \lambda_n$, Fig.7); performing a coarse wavelength demultiplexing for dividing the high bit-rate signal into wavelength streams (Lin et al. teach using DEMUX #1, #2, ..., to divide the multi-wavelength signal into $\lambda_1, \lambda_1 + \text{FSR}, \lambda_1 + 2\text{FSR}, \dots, \lambda_2, \lambda_2 + \text{FSR}, \lambda_2 + 2\text{FSR}, \dots, \dots, \lambda_n, \lambda_n + \text{FSR} \dots$, Fig.7, Col.7, lines 18-19) broader than the predetermined channel spacing (Lin et al. teach there is the space FSRs between two neighboring wavelengths $\lambda_1, \lambda_2, \dots, \lambda_n$, Fig.7 so the spacing between streams are wider); and (c) and filtering at least one time demultiplexed stream through a wavelength filter (320, Fig.7) for ~~for~~ obtaining at least one individual wavelength channel ($\lambda_1, \lambda_2, \dots, \lambda_n, \lambda'_1, \lambda'_2, \dots, \lambda'_n$, Fig.7). Therefore, it would have been obvious to a person having ordinary skill in the art at the time of the invention to incorporate a demultiplexer apparatus, such as the one of Lin et al., to replace the LIGHT DEMULTIPLEXING & BRANCHING in the system of Ooi et al. in order to obtain output signal with larger frequency spacing than that of input signals."

Similar to claim 1 of instant application, also in claim 15 the key differentiator from the teachings of Ooi et al. is the way how a signal containing multiple wavelength channels is treated after the optical time division demultiplex.

To emphasize this fact, claim 15 has been amended by the appropriate inclusion of words "wherein at least one of the demultiplexed wavelength bands has more than one wavelength channel for carrying data information" and "signals each comprising the plurality of wavelength bands".

In re Patent Application of:

FARRIES

Serial No. 09/886,998

Filed: 06/25/2001

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Nowhere do Ooi et al. teach the acceptance of more than a single wavelength into their optical switches (22 in Figs. 4 and 7, for example). In fact, as elaborated above, they assume that a single wavelength stream enters the mentioned switches.

At the same time, Lin et al. teach the optical wavelength division demultiplex of a compound signal into single wavelength channels. Nowhere do they teach or suggest that at an intermediate stage within their optical wavelength division demultiplex system the possibility of using means for reducing the bandwidth of the wavelength bands.

Thus, the present invention could not have been obvious from any simple combination of the teachings of Ooi and Lin et al.

Claim 17

As also explained above in reference to claim 15, Lin's patent differs from instant application (claim 1 (b)) in that his system has no provision for reducing the bandwidth of each wavelength band.

Claims 13 and 14

In the office action,

"Claim 13-14 are rejected under 35 U.S.C. 103(a) as being unpatentable over Ooi et al. (US Patent No: 6,118,564) in view of Lin et al. (US Patent No: 6,782,203) and further in view of Pan et al. (US Patent No: 5,652,814)."

The Examiner cites Pan et al. (US Patent 5,652,814) as an example of a wavelength splitter on the input end of the

demultiplexer as disclosed in Ooi's patent to achieve an equivalent function of instant application:

"Pan et al. from the same field of endeavor teach wavelength demultiplexing apparatus (Fig.25) with first demultiplexing means (271, Fig.25) for coarse demultiplexing N channel ($\lambda_1, \lambda_2, \lambda_3, \lambda_4, \lambda_5, \lambda_6, \lambda_7, \lambda_8$, Fig.25) into M sub-signals (Sub-signals $\lambda_1, \lambda_2, \lambda_3, \lambda_4$, and $\lambda_5, \lambda_6, \lambda_7, \lambda_8$, Fig.25) and second demultiplexing means (272, and 273, Fig.25) to demultiplex M signals (Sub-signals $\lambda_1, \lambda_2, \lambda_3, \lambda_4$, and $\lambda_5, \lambda_6, \lambda_7, \lambda_8$, Fig.25) into R sub-signals (λ_1 and λ_2 , and λ_3 and λ_4 , λ_5 and λ_6 , λ_7 and λ_8 , Fig.25) and third demultiplexing means (274, 275, 276 and 277, Fig.25) to demultiplex the R signals (λ_1 and λ_2 , and λ_3 and λ_4 , λ_5 and λ_6 , λ_7 and λ_8 , Fig.25) to single channel ($\lambda_1, \lambda_2, \lambda_3, \lambda_4, \lambda_5, \lambda_6, \lambda_7, \lambda_8$, Fig.25)."

The examiner concludes that:

"Therefore, it would have been obvious to a person having ordinary skill in the art at the time of the invention to incorporate a demultiplexer apparatus, such as the one of Pan et al., to replace the demultiplexing means (350 Fig.7 of Lin et al.) in the system of Ooi et al. modified by Lin et al. in order to provide a demultiplexing means for advanced fiberoptic systems of higher performance, low cost, and superior reliability (Col.2, lines 23-26)."

The reference mentioned above, col. 2, lines 23-26, reads:

In re Patent Application of:

FARRIES

Serial No. 09/886,998

Filed: 06/25/2001

"Furthermore, these advanced couplers and isolators provide for advanced fiberoptic systems of higher performance, lower cost, and superior reliability."

In fact the object of Pan et al. is to improve the performance of lensed couplers and isolators over fused couplers:

"The described wavelength division multiplexer coupler has a high performance. Insertion loss has been found to be 0.2 dB. compared to 0.5 to 1.0 dB for fused fiber WDM couplers, and the polarization dependent losses have been found to be 0.01 dB, compared to 0.1 db for the fused couplers. Crosstalk is very low; isolation losses exceed 30 dB compared to 18 dB for the fused fiber couplers."

So it is not surprising, that Pan et al. are silent on bandwidth and associated issues of overlapping channels of high-capacity signals with densely spaced wide bandwidth signal channels. Neither do they show any interest or motivation to economize on the figure of merit of the optical filters used within their couplers. All the filters described in Fig. 25 are required to separate adjacent wavelength channels from each other. Proceeding from the last filters, e.g. 274, which separates only two adjacent channels, λ_1 and λ_2 , the figure of merit demanded of the filters increases progressively to the upstream filters, e.g. 272, which must have an adequate passband to pass two channels λ_3 and λ_4 , while providing adequate cutoff between λ_2 and λ_3 . The highest figure of merit is required for the filter 271, which must have an adequate passband to pass four channels λ_5 , λ_6 , λ_7 , and λ_8 , while providing adequate cutoff between λ_4 and λ_5 .

In re Patent Application of:

FARRIES

Serial No. 09/886,998

Filed: 06/25/2001

The apparatus described by Pan et al. requires a larger number of high figure of merit filters compared to the instant invention. The highest figure of merit of these filters would be higher than that of the wavelength division multiplex means defined in claim 1(a) of instant application.

Because the time domain demultiplex technique claimed in claim 1(b) of instant application can be used to narrow the bandwidth of each wavelength division multiplex channel, the required figure of merit of the filters defined in claim 1(c) of instant application is lower than that of filters 274-277 in Fig. 25 of Pan et al. In high-capacity systems, the number of channels can be large. Since one of these filters is required for each signal channel, using filters of lower figure of merit can result in an appreciable savings in system cost.

Furthermore, the time domain demultiplex technique claimed in claim 1(b) can narrow the bandwidth of many wavelength division multiplex channels simultaneously, thereby spreading the cost of this technique over all the channels.

Thus, just like Lin's patent, the apparatus of Pan et al. has no provision for reducing the bandwidth of each wavelength channel, such as the optical time domain demultiplex defined in claim 1 (b) of instant application. Even if a splitter were incorporated according to Pan's patent, it would result in a lower performance system in terms of bit-rate limitations.

Earlier considerations regarding the inability of the system taught by Ooi et al. to deal with more than one wavelength in

its optical switches and identification circuits apply here as well.

To emphasize this fact, also claim 13 has been amended by the appropriate inclusion of words "wherein at least one of the M sub-signals comprises more than one wavelength channel" and "wherein the R sub-signals comprise the same wavelength channels".

Pan's configuration may introduce additional penalty resulting from optical losses due to the multiple demultiplex stages required, as well as sensitivity to relative drift due to the large number of optical components with critically interdependent tolerances. The larger number of components tends to increase manufacturing costs. Above all, the demands on the filter figure-of-merit are much greater, resulting in additional manufacturing costs.

As a low loss, high bit-rate demultiplex is an object of the instant application, Pan's patent appears to be teaching away from this objective.

In summary, in view of the foregoing amendments and remarks, it is respectfully submitted that the amended claims 1, 13 and 15 and all claims dependent thereon are patentable in view of cited references.

Early and favorable reconsideration of the Examiner's objections would be appreciated.

In re Patent Application of:

FARRIES

Serial No. 09/886,998

Filed: 06/25/2001


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Should any minor informalities need to be addressed, the Examiner is encouraged to contact the undersigned attorney at the telephone number listed below.

Please charge any shortage in fees due in connection with the filing of this paper, including Extension of Time fees, to Deposit Account No. 50-1465 and please credit any excess fees to such deposit account.

Respectfully submitted,

Dated: 1-11-2006


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